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TO: DON SMITH/EPA

DATE: SEPTEMBER 23, 1991

FROM: PAUL YOUNG/FIT I PY

COPIES: S. DANKE
S. HAYES
T. O'CONNOR

SUBJECT: **FINAL TARGET MEMO**
CRANSTON SANITARY LANDFILL
Cranston, Rhode Island
TDD NO. F1-9103-13
REFERENCE NO. $375RI53HR
CERCLIS No. RID084812577

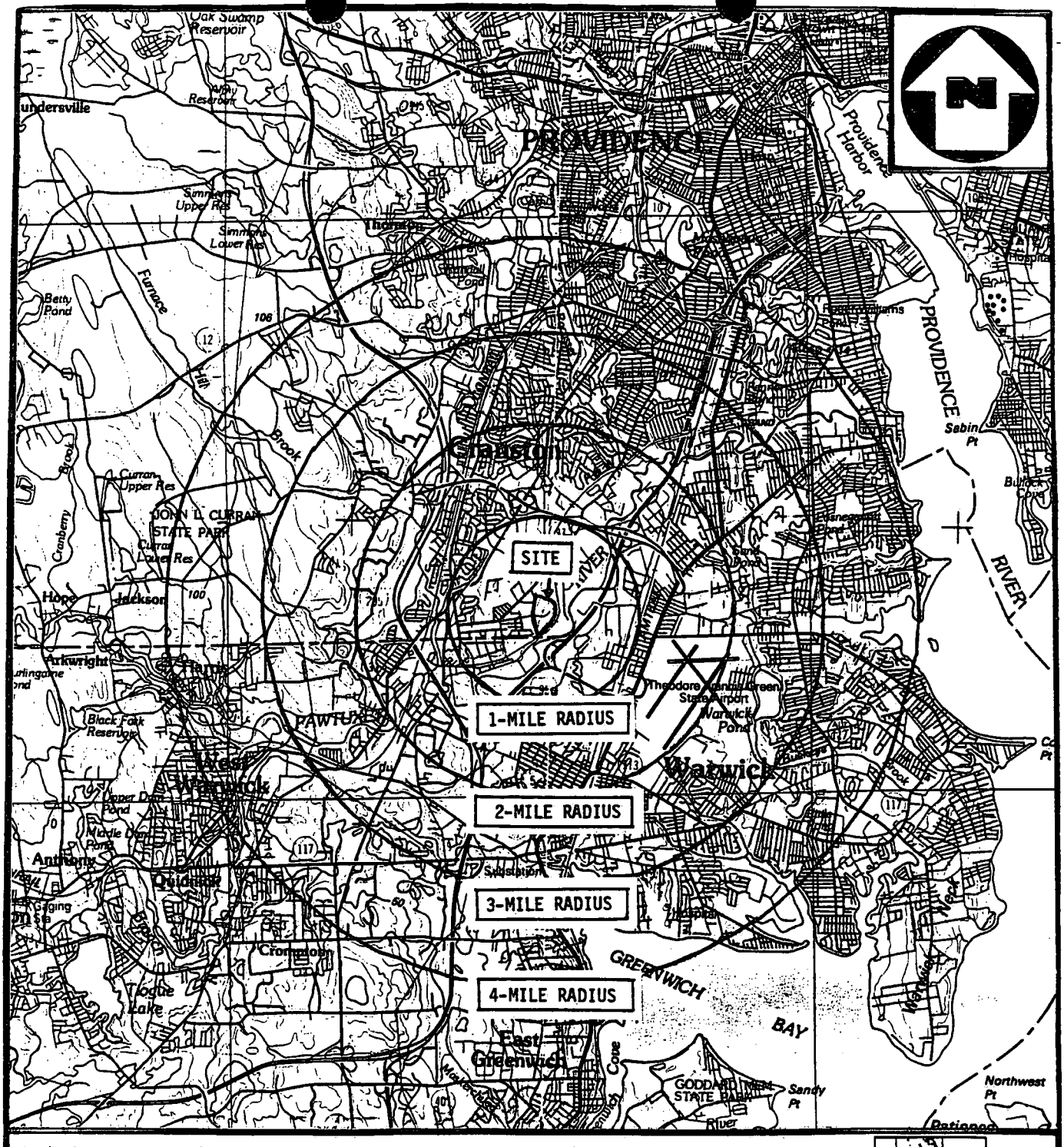
INTRODUCTION

This memo presents a summary of human and environmental resources identified as being potentially exposed to contamination via groundwater, surface water, soil, and air pathways as a result of past waste disposal practices at the Cranston Sanitary Landfill in Cranston, Providence County, Rhode Island.

The Cranston Sanitary Landfill occupies approximately 47 acres of land on Pontiac Avenue. The property is situated on the west bank of the Pawtuxet River, approximately 4 miles southwest of Providence (Figure 1). The east and south portions of the property abut the north flowing Pawtuxet River. The landfill began operating in 1943 for disposal of domestic waste and eventually began accepting industrial waste until operations ceased in the early 1980s. Reportedly, large quantities of hazardous wastes were disposed of at the landfill during the 1970s. Volatile organic compounds (VOCs) and inorganic elements have been detected in groundwater samples collected from monitoring wells located onsite (E & E 1982, pgs. 3-1 to 3-3, Appendix C). As of May 1991 the Cranston Sanitary Landfill was being used as a trash transfer station (Hill 1991b).

GROUNDWATER RESOURCES

The aquifer of concern is composed of overburden materials consisting of glacial outwash deposits and ice-contact deposits such as kame terraces, kames, and eskers. The glacial outwash deposits are composed predominantly of sand and the ice-contact deposits vary from boulders and cobbles to sand and silt (Allen 1956, pgs. 10, 11, 13). The Cranston Sanitary Landfill is situated on the western edge of a north-



BASE MAP IS A PORTION OF THE FOLLOWING U.S.G.S. 30 X 60' QUADRANGLE(S):

Providence, Rhode Island-Massachusetts-Connecticut - 1984

KILOMETERS 1 0 1 2 3 4 5 6 7 8 9

MILES 1 0 1 2 3 4 5 6

FOUR MILE RADIUS

CRANSTON SANITARY LANDFILL

CRANSTON, RHODE ISLAND

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FIGURE 1

south trending buried bedrock valley. Glacial outwash deposits predominate within this valley (E & E 1982, pg. 2-10). The groundwater in the vicinity of the Cranston Sanitary Landfill is described as being largely unconfined. Groundwater flow from the Cranston Sanitary Landfill is to the south-southeast towards the Pawtuxet and Providence Rivers or south towards Greenwich Bay (Allen 1956, pgs. 10, 11, 13). Depth to groundwater ranges from 20 to 70 feet (E & E 1982, Table A1). Reference materials do not indicate the existence of uninterrupted, impermeable layers or hydrologic discontinuities between this aquifer or between any other portions of the hydrologic units within four miles of the property; therefore, all wells drawing water from hydrologic units within four miles of the Cranston Sanitary Landfill are considered, for the purposes of this report, to be potentially susceptible to any hazardous substances which might be found to be migrating in groundwater. Likewise, for the purposes of this report, the aquifer of concern will include all hydrologic units located within four miles of the Cranston Sanitary Landfill.

Surficial materials in the vicinity of the property include glacial till of variable thickness, well-sorted sands, and coarse alluvial sand and silt (USGS 1955). The thickness of the till beneath the Cranston Sanitary Landfill property varies from 10 to 30 feet (E & E 1982, pg. 2-10). The bedrock in the vicinity of the Cranston Sanitary Landfill is part of the Narragansett Basin, Rhode Island formation. The Rhode Island formation is characterized by sedimentary deposits such as sandstones, shales, graywacke, meta-anthracite, and conglomerates. A bedrock outcrop is located on the property and strikes in a east-west trending direction (USGS 1952).

Drinking Water Resources

Resources subject to potential contamination via the groundwater pathway include people drinking water from private wells located within a 4-mile radius of the Cranston Sanitary Landfill. Approximately 163 people obtain their drinking water from groundwater sources within 4-miles of the Cranston Sanitary Landfill. The exact location of the closest private well to the property is unknown, but is within the 1.00 - 2.00 mile ring. There are no municipal or community drinking water supplies within a 4-mile radius of the Cranston Sanitary Landfill property. The following table lists the approximate population that obtain drinking water from private wells located within the specified radii of the Cranston Sanitary Landfill.

TABLE 1
PRIVATE WELL USERS

Radial Distance (miles)	Approximate Population Served by Private Wells
Onsite	0
0.00-0.25	0
0.25-0.50	0
0.50-1.00	0
1.00-2.00	10
2.00-3.00	62
3.00-4.00	91
Total =	163

(Koszalka 1991c; NWWA 1986)

The remainder of the population residing within a 4-mile radius of the property is supplied drinking water either from groundwater sources located beyond the 4-mile radius or from surface water sources (Koszalka 1991c). Wellhead protection status is pending for all Rhode Island wells (Andrichak 1991).

Other Groundwater Resources

Groundwater within 4 miles of the Cranston Sanitary Landfill property is not used for irrigation purposes as the area is highly urbanized (Young 1991b).

SURFACE WATER RESOURCES

Resources subject to potential contamination via the surface water migration pathway include fisheries, sensitive environments (wetlands), and persons engaging in recreational activities on the Pawtuxet and Providence Rivers, and Narragansett Bay.

Surface water drainage from the Cranston Sanitary Landfill is to the south and southeast into the Pawtuxet River and floodplain area (E & E 1982, pg. 2-10). Alteration of topographic features on the property have changed surface water drainage flow patterns. A large hill located on the south side of the Cranston Sanitary Landfill diverts surface water runoff to the northern part of the property. This surface water then flows into an intermittent stream and a few small ponds prior to discharging into a small brook located to the east of the property. This brook flows south between the landfill and railroad tracks and then flows into

the Pawtuxet River. Surface water runoff not diverted to the north by topographic changes at the landfill also drains into this brook as it flows along the eastern and southern edges of the landfill (Figure 2) (E & E 1982 pg. 2-12).

The measurement of the 15-mile surface water drainage pathway was made beginning at the probable point of entry furthest downstream along the Pawtuxet River from the property, which is the southern portion of the Cranston Sanitary Landfill. From the probable point of entry, the Pawtuxet River flows approximately 7.0 miles northeast before it converges with the Providence River. The Providence River then flows into Narragansett Bay at approximately 12 miles. The 15 mile target distance limit has been approximated to end in Narragansett Bay, near Bear Point (to the west), and Popasquash Neck (to the east) (Figure 3) (USGS 1975a, 1975b, 1975c, 1979).

The northern half of the Cranston Sanitary Landfill is on the southeastern side of Flank Hill and the southern half of the property is on the floodplain of the Pawtuxet River (E & E 1982, pg. 2-1). The flood frequency of the property is unknown based on available file information.

Drinking Water Resources

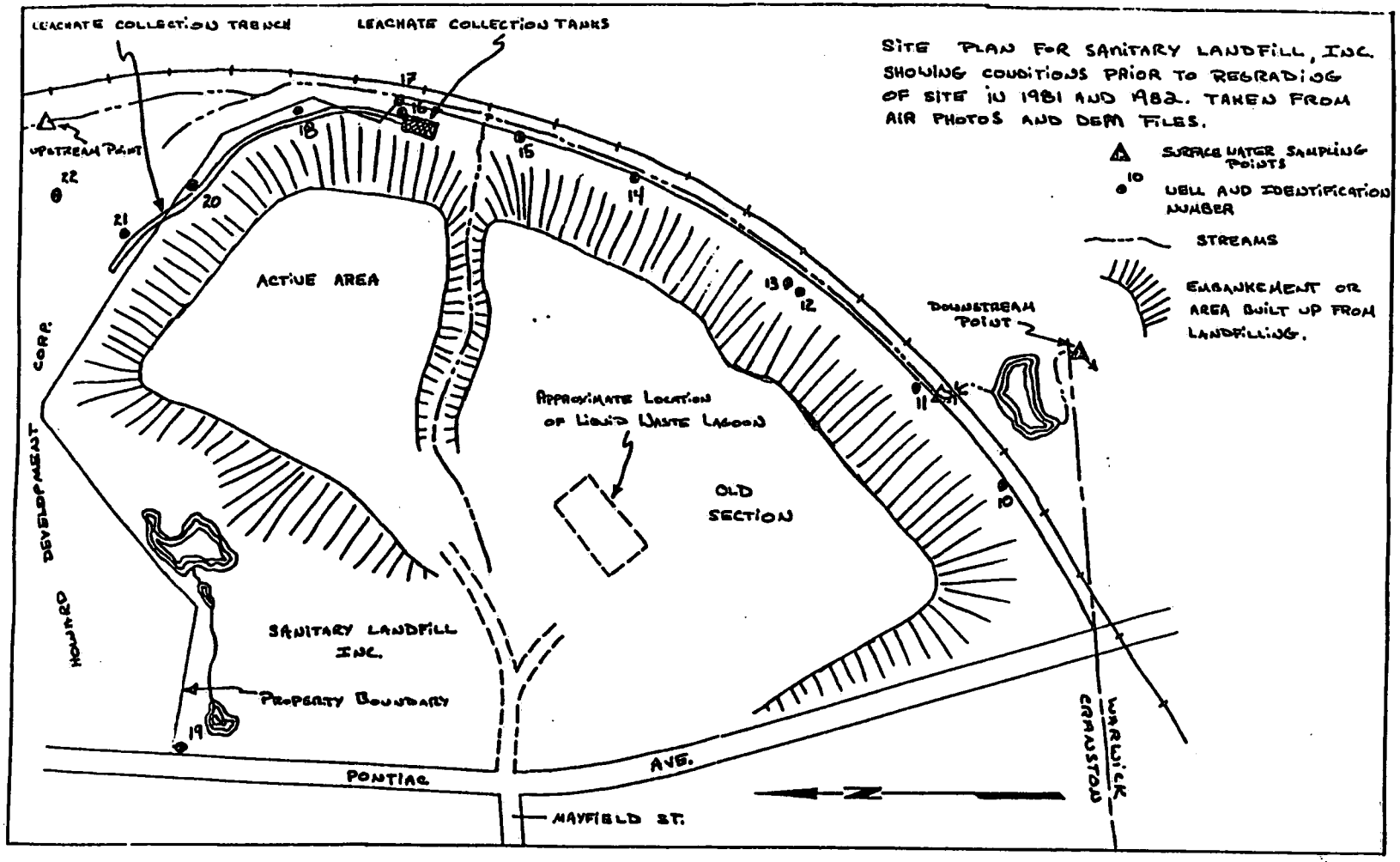
There are no surface water intakes along the 15-mile surface water pathway (USGS 1975a, 1975b, 1975c, 1979). From the Cranston Sanitary Landfill property to the Providence River, the Pawtuxet River is used for industrial purposes (Hill 1991a). Water supplies for the Cities of Cranston, Warwick, and Providence are obtained from surface water sources located outside the four mile radius and are not along the 15-mile surface water pathway (Milikovsky 1990; Wolfe 1990).

The average flow rate for the Pawtuxet River as measured between 1941 and 1990 from a gaging station on the Pawtuxet River, located 0.7 miles upstream from the convergence of the Pocasset River, is 345 cubic feet per second (Young 1991).

Human Food Resources

The Pawtuxet River is described as a Class C river which is suitable for "non-contact" boating (RI DEM 1987). Recreational uses of the Pawtuxet River include canoeing and fishing along parts of the river, however as one gets closer to the City of Providence, the Pawtuxet River becomes industrially developed and only canoeing occurs (Hill 1991a).

Even though the Providence River is a major shipping lane, some boating and fishing occurs towards the Narragansett Bay



NOT TO SCALE

SITE SKETCH TAKEN FROM ECOLOGY AND ENVIRONMENT, INC. - 1982

SITE SKETCH

CRANSTON SANITARY LANDFILL

CRANSTON, RHODE ISLAND

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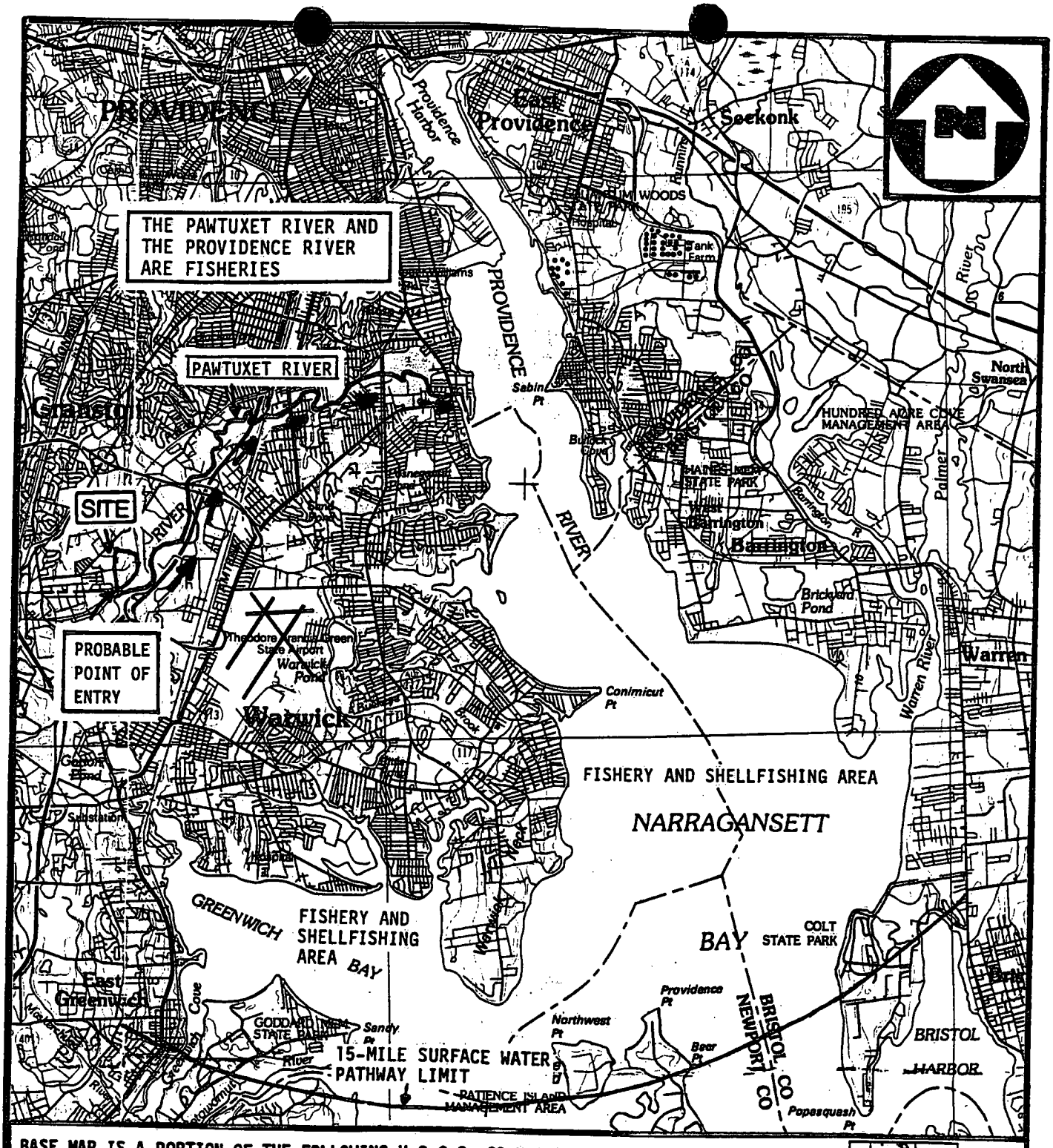
FIGURE 2

FIGURE 2



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KILOMETERS 1 0 1 2 3 4 5 6 7 8 9

MILES 1 0 1 2 3 4 5 6

15-MILE SURFACE WATER PATHWAY

CRANSTON SANITARY LANDFILL
CRANSTON, RHODE ISLAND

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FIGURE 3

section of the Providence River south of Gaspe Point. Shellfishing is a major industry in the area surrounding Narragansett Bay and Greenwich Bay and is considered to be one of the most fertile shellfishing areas in the world. Shellfishing also occurs at the north end of Narragansett Bay near the mouth of the Providence River; however, the shellfishing beds are closed periodically due to pollution (Hill 1991c). Narragansett Bay is also used for swimming, boating, and fishing. There are some beach areas located on the southern side of Narragansett Bay (Hanley 1990).

Marine species which are commercially harvested in the Narragansett Bay area include hardshell clams ($19 million annually), and lobster (1.15 million pounds annually). Conch is also harvested commercially but in smaller amounts. Finfish harvested commercially include summer and winter flounder, butterfish, several species of herring, bluefish, and striped bass (Reilly 1991).

Environmental Resources

There are approximately 0.75 miles of wetland frontage, 6.5 miles from the probable point of entry, along the 15-mile surface water pathway (USGS 1975a, 1975b, 1975c, 1979).

Stressed vegetation has been observed on the Pawtuxet River floodplain downgradient of the Cranston Sanitary Landfill. Infrared aerial photographs taken by the US EPA in 1980 indicated vegetative stress along surface water pathways and adjacent to two ponds nearest the eastern side of the landfill (E & E 1982, pg. 2-1).

Table 2 lists sensitive environments along the 15-mile downstream surface water pathway.

TABLE 2
Sensitive Environments

Name of Sensitive Environment	Surface Water Body Associated with Environment	Distance to Environment from Probable Point of Entry (miles)	Type of Environment
Narragansett Bay	Narragansett Bay	12	Fisheries
Narragansett Estuarine Sanctuary	Narragansett Bay	12	Estuarine Sanctuary

Prudence Island Management Area	Narragansett Bay	14	Management Area

(O'Connor 1991; USGS 1980)

SOIL EXPOSURE PATHWAY

Targets subject to potential contamination through contact with soils at the Cranston Sanitary Landfill include employees who work onsite and local residents living within 200 feet of the source areas. There are 10 workers on the property (O'Connor 1991). There are a total of 16 single family homes located within 200 feet of the western edge of the Cranston Sanitary Landfill (Hill 1991b). Table 3 summarizes the onsite residents and workers; if the residences are located within 200 feet of known or suspected contaminated areas, then they are considered onsite residents.

TABLE 3
Onsite residents/workers

	Population	Source Area	Population Designation	Distance to Source Area
Onsite Residents	42	Cranston Sanitary Landfill	Residents	Less than 200 feet
Onsite Workers	10	Cranston Sanitary Landfill	Transfer Station Worker	Onsite
Total	52			

(Hill 1991b; O'Connor 1991)

A chain-link fence encompassing the Cranston Sanitary Landfill precludes direct access to the property (Hill 1991b). The Pawtuxet River also prevents direct access to the property from the east and south sides of the property (USGS 1975a).

The total population within 1 mile of the Cranston Sanitary Landfill is approximately 7,700 people (Koszalka 1991b). The nearest school is the Pettaconsett School in the City of Cranston and is located approximately 1.5 miles north of the Cranston Sanitary Landfill property (USGS 1975). Based on available file information, there are no terrestrial

sensitive environments located on the Cranston Sanitary Landfill property.

AIR PATHWAY

Resources subject to potential contamination via the air pathway include residents and sensitive environments located within 4 miles of the Cranston Sanitary Landfill. Land use in the surrounding area is residential, industrial, and commercial. The closest residence is located within approximately 200 feet of the Cranston Sanitary Landfill (Hill 1991c).

Table 4 lists the approximate population located within the specified radii of the property.

TABLE 4
POPULATION

Radial Distance (Miles)	Approximate Population
0.00-0.25	363
0.25-0.50	1,596
0.50-1.00	5,741
1.00-2.00	20,367
2.00-3.00	34,296
3.00-4.00	51,265

Total = 113,628

(Koszalka 1991b; USGS 1975a, 1975b, 1975c, 1979)

Table 5 presents information regarding sensitive environments and wetland acreage within four miles of the Cranston Sanitary Landfill.

TABLE 5
Sensitive environments and total wetland area located within a 4-mile radius of the Cranston Sanitary Landfill

Distance Ring (miles)	Sensitive Environments	Total Wetland Areas (acres)
onsite	none	0
0.00-0.25	none	0
0.25-0.50	Wetland	3

0.50-1.00	Wetland	10
1.00-2.00	Wetland	56
2.00-3.00	Pawtuxet River Reservation	210
3.00-4.00	none	0
	Total	279

(USGS 1975a, 1975b; Koszalka 1991a)

SUMMARY

Approximately 163 people obtain their drinking water from private wells located within 4 miles of the Cranston Sanitary Landfill. Water supplies for the Cities of Cranston, Warwick, and Providence are obtained from surface water sources located outside the four mile radius and are not along the 15-mile surface water pathway.

The east and south portions of the property abut the north flowing Pawtuxet River. Resources subject to potential contamination via the surface water migration pathway include fisheries, sensitive environments, and persons engaging in recreational activities on the Pawtuxet and Providence Rivers, and Narragansett Bay. Commercial fishing and shellfishing occur in the areas surrounding the mouth of the Providence River and Narragansett Bay. There are no drinking water intakes along the 15-mile surface water pathway. There are approximately 0.75 miles of wetland frontage located along the 15-mile surface water pathway.

There are approximately 7,700 people who reside within a 1-mile radius of the Cranston Sanitary Landfill property. Sixteen residences (42 people) are located within 200 feet of the property. Approximately 113,628 people reside within four miles of the Cranston Sanitary Landfill, and there are a total of 1,099 acres of wetlands within the four-mile radius.

Approval: Janet Pillion for
Robert Jubach
FIT Office Manager

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